

adic

AML/J

**Operator
Guide**

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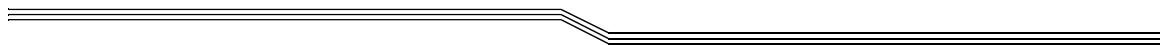
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1 **Introduction**

1.1 Contents

This Guide contains information and instructions for the safe operation of the AML/J system.

1.2 Target group

This Guide is written for users who work with the AML/J.

1.3 Layout of the Guide

The Guide is broken down into the following chapters:

Chapter 1	<i>Introduction</i> - Notes on the use of the Guide
Chapter 2	<i>Overview</i> - Contains general information on the AML/J components.
Chapter 3	<i>Safety</i> - Describes the danger symbols, messages, safety functions and considerations for the safe operation of the AML/J.
Chapter 4	<i>Operation</i> - Describes the functions for switching the AML/J on and off.
Chapter 5	<i>Menus and commands</i> - Describes the menus and the commands executed by the AML/J.
Chapter 6	<i>Processing media</i> - Describes the I/O unit and its use.
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1.4 Further documentation

DOC D00 024	AML/J Maintenance Guide
DOC D00 014	AML/J Software Backup
DOC D00 007	AML/J Installation Guide
DOC E00 003	AMU Installation Guide
DOC E00 007	AMU Problem Determination Guide
DOC E00 014	AML Controller User Guide
DOC E00 005	AMU Reference Guide

1.5 Explanation of the symbols and notes

The following symbols and notes draw your attention to important information.



For detailed explanation of the symbols see *Warning indications* on page 3-3.

<1>+<2>	Press keys simultaneously
<i>italics</i>	Heading, e.g. Chapter 3, <i>Safety</i> File name, e.g. <i>dasdata.ini</i> Variable, e.g. <i>client_name</i>
Chicago	Term appearing on the workspace of the AMU
bold	Special term, e.g. Scratch-Pool
courier	Lines or terms in an input window - Program message - Command - Parameter or file
[courier]	Optional parameters
Param1 Param2	Alternative parameters
☞	Reference

1.6 Technical support

Warning



The use of the AML/J by untrained personnel can lead to dangerous situations. The consequence can be severe to lethal injuries due to moving or current-conducting parts. For this reason an introductory course at ADIC/GRAU is recommended for all persons who handle the AML/J.

The operator is responsible that the following functions are performed on the system only by qualified personnel:

- Preparation for operation
- Setting up
- Starting the system
- Application
- Shutting the system down
- Maintenance
- Restart

Warning



You may perform certain work and adaptations yourself only if you are qualified for this by corresponding education and training.

It is extremely important that the user is familiar with all safety rules before working with the system and follows them.



If you cannot solve a problem with the aid of this document or if you are interested in a recommendation regarding training, please contact your contract partner or the ADIC/GRAU Technical Assistance Center (ATAC).

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1.7 Product observation

We are legally obliged to observe our products even **after** delivery.
Therefore please notify us about everything which is of interest to us:

- Changed setting data
- Experience with the product
- Repetitive faults
- Difficulties with this Guide



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2 Description of the system

2.1 Overview of the system components

Storage media such as magnetic tape cartridges, optical disks and CD-ROMs are brought automatically into the associated drives and fetched from there again with the AML/J. The storage media are brought to the drives with the aid of software in the host and in the AML/J control unit and discharged from these drives again.

The AML/J is a modular system and consists of

- a basic module
 - Handling unit
 - Storage racks
 - Control cabinet
 - I/O unit (E/I/F)
- up to 9 extension modules (optional)
 - Storage racks
 - I/O unit (E/I/F)



Figure 2-1: AML/J basic module

2.2 Host connection

AML/J is connected through the AMU (AML Management Unit) to one or several hosts. The possibilities of the connection are described in the AMU Reference Guide.

2.3 Description of function

The AML/J system can be installed on the unfinished floor or on a false floor.

The handling unit moves the cartridges between the storage cells, drives and the I/O unit. The handling unit has a gripper. A barcode scanner on the gripper identifies the cartridges at the compartments in the archive. Further details are described under *Handling unit* on page 2-6. The cartridges can be brought into the AML/J system or moved out from the system with the aid of the I/O unit without interrupting the work. Additional details are described under *I/O unit* on page 2-7.

Manual access to the compartments in the archive, the handling unit and the drives is through an access door after switching off the power supply.

The cartridges in the AML/J are moved by host requests. Primary requests are for mounting and discharging cartridges in the drives and for inserting/ejecting cartridges into/out from the AML/J.

Each cartridge can have an external machine and user readable label to identify the cartridge in the AML/J at stocktaking and when adding a cartridge to the AML/J. The AMU stores the physical storage location of the cartridge in a database which is based on the **Volser** (Volume Serial Number).

Apart from the commands for moving the tape cartridges, the host can also request status, configuration and cartridge storage information from the AML/J control unit.

2.4 Functional units

The AML/J system consists of the following functional units:

- Drives
- Control cabinet with:
- AML/J control unit
- AMU (AML Management Unit)
- Storage cells (linear racks)
- Handling unit
- I/O units

2.4.1 Drives

The AML/J system supports a large number of drives for different storage media.

2.4.2 Control cabinet

The control unit of the system is housed in a control cabinet. This control cabinet contains:

- AMU PC
- Control unit
 - Power supply
 - Motor control
 - Interface converter
 - Safety system
- Drive(s) (optional)

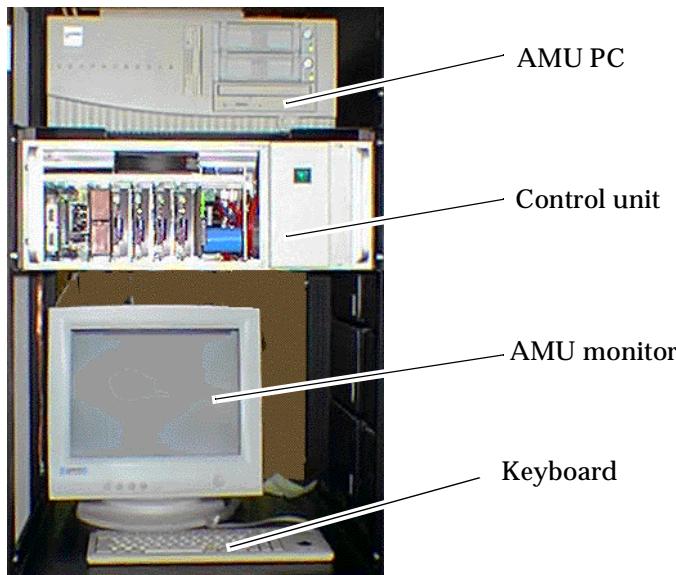


Figure 2-2: Control cabinet

2.4.3 AML Management Unit (AMU)

The AMU is the control processor for the AML system. In the normal mode the host computer sends the commands to the AMU for controlling the system. The AMU is located next to further power supply components in the control cabinet Figure 2-2: on page 2-3.

It is possible to connect a second AMU PC in parallel to back up against failures due to failures of the PC hardware. This redundant version is called **Dual-AMU**, and a few cables have to be reconnected for the change.

Hardware components

The AMU hardware consists of:

- A computer (AML controller) with screen, keyboard and trackball or mouse
- Programmable Multi-Axis Controller (PMAC board)
- Network board (Token Ring, Ethernet or FDDI)

Software components

The AMU software components are:

- Operating system OS/2
- Communication Manager/2 , TCP/IP
- Database Manager/2
- AML Management Software (AMS)

Tasks of the AMU:

- Host communication
 - interprets the commands coming from the host computer
 - checks these commands for executability
- Archive catalogue administration
 - stores the logical coordinates of the compartments
 - assigns the cartridges to the compartments
 - knows the status of compartments and drives
 - stores information on scratchpool administration
- Conversion of the logical coordinates into physical coordinates
- Communication with the control unit
- User interface
 - for start-up
 - for service
 - for the operator
- Configuration (describes the individual structure of the archive)



Information

The AMU does not register the data contents of the cartridges.

2.4.4 Storage cells

The AML/J system contains compartments (storage cells) in linear racks (stationary storage segments (☞ Figure 2-3)). Table 2-1: Coordinates of the storage cells on page 2-5 contains the coordinates of the storage cells.



Figure 2-3: Example of storage cells

Table 2-1: Coordinates of the storage cells

L3 - LD	01 - 99	01	01 - 99	01 - 99
Type	Module	Segment	Row	Compart- ment

The module number corresponds to the number of the segment whereby the assignment of the module numbers to the segment can be determined by the user at start-up and the segment is always 01. The rows are counted from below to above and the compartments from the left to the right. Optical disks occupy two compartments in the database.

2.4.5 Handling unit

The handling unit identifies and moves cartridges between the storage cells, drives and the I/O unit.

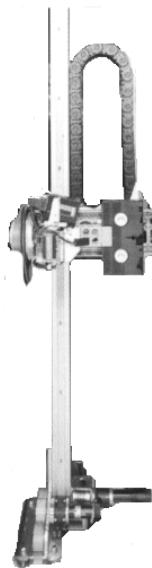


Figure 2-4: AML/J handling unit

Access to the archive compartments and the drives is facilitated with the handling unit. The handling unit executes the commands of the AML Management Software (AMS) and returns status messages as response.

The handling unit is equipped with a (laser) barcode scanner. Typical tasks of the handling unit are inserting and ejecting cartridges, placing and gripping cartridges in the archive, mounting the connected drives with the cartridges and reading a barcode label attached to the cartridges.

Technical data of the handling unit

- Cartesian robot with 4 axes:
 - 3 linear axes
 - 1 rotary axis
- Drive with direct current servomotors
- Position measuring system (optical digital encoder) and home position sensors
- Transmission of the torques with toothed drive belts
- Driving axis guided
 - with rollers on 2 guide rods below
 - by one guide rod with loose bearing (play compensation) above

2.4.6 I/O unit

The I/O unit facilitates inserting and ejecting cartridges without interrupting normal processing (☞ Figure 2-5:).



Figure 2-5: I/O unit/E

2.5 Cartridges

Each cartridge in the AML/J system can have an external user and machine readable label for identifying the Volsers (Volume Serial Number). The external label contains between one and 16 characters for the Volser. The Volser is composed of the uppercase letters A-Z and the numbers 0-9. The AML/J system supports different types of label (e.g. "Code 39" and "STK").

2.6 Technical Data

Dimensions

Table 2-2: Size of the AML/J components

	Width x depth	Height
Basic module	1.00 m x 1.50 m (3.28 ft x 4.92 ft)	2.05 m (6.73 ft)
Extension module	0.75 m x 0.82 m (2.46 ft x 2.69 ft)	
Control cabinet		

Weight without/with cartridges (3480/3490)

Table 2-3: Weight of the AML/J components

	Weight in lbs		Weight in kg	
	With media	Without media	With media	Without media
Basic module	721	509	326	230 kg
Control cabinet	-	331	-	150 kg
Extension module	688	454	311	205 kg

Maximum floor loading

Table 2-4: Floor loading of the AML/J components

Basic module	390 kg/m ²
Extension module	

2.6.1 Electrical system

Table 2-5: Electrical data of the AML/J

	Europe	North America
Total system connection	230 V \pm 10% 1, N, PE	110 V \pm 10% 1, N, PE
Fuses (by customer)	16 A fuse slow-blow	10 A fuse slow-blow
Power section voltage	48 V =	
Frequency	50 Hz	60 Hz
Control voltage	24 V =	
Degree of protection	IP 50	

Heat dissipation

Maximum 1.2 kW

2.6.2 Noise

Table 2-6: Noise caused by the AML/J

Total system	80 dB (A)
--------------	-----------

2.6.3 Climatic conditions

Table 2-7: Climatic conditions for operating the AML/J

Temperature	10 .. 32 °C
Humidity	15 .. 80%

3 Safety



Information

Apart from the safety provisions in this chapter, the local and specific technical safety regulations apply.

Avoid hazards during maintenance and in operation of the system by

- safety-conscious behaviour
- careful actions



CAUTION!

Knowledge of and observance of these instructions are indispensable for the safe handling of the ADIC/GRAU Storage Systems AML/J systems.

3.1 Use as intended

The quotation and the order confirmation as well as the scope defined in this document are part of the AML/J documentation. Any use other than that specified in this is considered to be not as intended.

This system is intended for processing:

- Magnetic tape cartridges
- Optical disks
- CD-ROMs in the CADDY housing

Any use extending beyond this is not as intended.

ADIC/GRAU Storage Systems is not liable for damages which arise because of use not agreed with it - the user bears the risk alone.

The following are also included in use as intended

- Compliance with the instructions in the instructions delivered with the system (this Guide, Operator and AMU Guides)
- Compliance with the inspection and maintenance regulations

3.2 Warning indications

ADIC/GRAU classifies hazards into different categories. Table 3-1: shows the relation between symbols, signal words, actual hazards and possible consequences.

Table 3-1: Warning indications

Symbol	Damage to...	Signal word	Definition	Consequences
	Persons	DANGER!	Directly threatening danger	Death or very severe injuries (maiming)
		WARNING!	Possibly dangerous situation	Possibly death or very severe injuries
		CAUTION!	Less dangerous situation	Possibly light or slight injuries
		WARNING! Dangerous voltage!	Directly approaching electrical danger situation	Death or severe injury
		CAUTION!	Less dangerous situation	Possibly light or medium injury
	Material	ATTENTION!	Situation possibly causing damage	Possibly damage of the product and its environment
		Electro-statically sensitive	Potential risk of damage to the electronics	Possibly damage to the product
		Information	Application tips and other important/useful information and hints	No dangerous or damaging consequences for persons or things

Especially emphasized paragraphs in this Guide warn against a hazard or draw your attention to important information. These include the following paragraphs and symbols:



In connection with the signal words of 'Danger' or 'Warning', this symbol warns against a dangerous situation in which personal death or severe injuries are threatening.

In connection with the signal word of 'Caution', the symbol warns against a dangerous situation in which light injuries can be the consequence.



There is risk of a lethal electric shock. Electrical current is possibly present at places identified with this symbol. Before all work always ensure that no electrical connections are under voltage.



Caution!

**This symbol is a laser warning.
Use only the described procedures for adjusting and setting up the laser. Injuries can be caused by laser light if other procedures are used.**



This symbol refers to specific regulations, rules, instructions and working procedures which must be observed. Nonobservation of this symbol can result in equipment damage or destruction or other material damage.



This symbol refers to the risk of equipment damage because of electrostatic discharges.



This symbol indicates a hint or important information for the user. No risks of personal or material damage are connected with this symbol.

3.3 Scope

These instructions apply for the ADIC/GRAU Storage Systems AML/J systems.

Further safety regulations for the components used in the system are not put out of force by these instructions.



Information

The documentation of the external manufacturers are integral part of the AML/J documentation.

3.4 Protective devices

The AML/J system is equipped with the following protective devices:

- Monitored access to the system
- Mechanical interlock
- Main switch

3.4.1 System access

The AML/J system is surrounded completely by panelling. Access to the system is possible only through a monitored door (or doors).

The panelling of the AML/J system separates the danger area from the normal working area. The danger area of the system is the area in which there is a risk of injury due to a movement of the components.



WARNING!

Movements of the mechanical components in the AML/J system can cause severe injuries. The access to the system may be opened only by authorized personnel.

3.4.2 Mechanical lock

The access door(s) to the system can be opened from the outside only with a key. Authorized personnel are responsible for the safety of the key.

3.4.3 Main switch

If you switch off the main switch, you stop the movement electronics and separate the system from the power supply. All movements of the robot are stopped immediately. Switch the main switch off immediately in the case of risk of injury or possible material damage.

ATTENTION!



Apart from emergency situations, the AML/J system is firstly always stopped with the normal shutdown routine before the main switch is switched off. ADIC/GRAU Storage Systems is not liable for damages because of actuation of the main switch in a manner not intended. The user bears responsibility solely for this.

WARNING!



Movements of the mechanical components in the AML/J system can cause severe injuries. Before switching on the main switch and restarting the AML/J system convince yourself that no risks for persons and material are caused by this.

4 Operation

In the normal case the host sends the commands to the AML/J. The AMU is used by the operator for control purposes. The operator is responsible for the following tasks:

- Starting the AML/J
- Stopping the AML/J
- Handling the cartridges

You will find information on handling the cartridges under *Inserting cartridges* on page 6-4 and *Ejecting cartridges* on page 6-5. In the case of equipment disturbances the operator can process the cartridges.

4.1 Switches on the control cabinet

You will find several switches for switching the components on and off in the control cabinet. In addition to the switches on the front of the control unit, a mains switch is located on the back of the control unit.

Figure 4-1: Control unit on page 4-1 shows a view of the front side of the control unit.

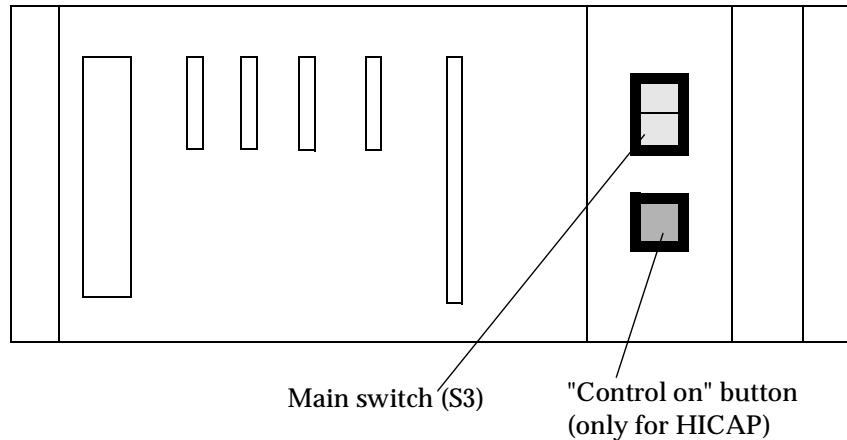


Figure 4-1: Control unit

The switches on the control unit are described in Table 4-1: .

Table 4-1: Control panel switches

	Switch	Description
1	Main switch S3	<p>Switching on the main supply voltage.</p> <p></p> <p>WARNING! Dangerous voltage!</p> <p>The following are not in the circuit of the main switch:</p> <ul style="list-style-type: none"> • Drives • AMU computer <p><CONTROL OFF> lights up if the control is ready but not active.</p>
2	<p>Only in systems with HICAP illuminated pushbutton (green)</p> <p>CONTROL ON</p>	<p>The control lamp lights up after actuation.</p> <p>Activates the control</p> <p>Prerequisites</p> <p>Main switch switched on, all doors are closed</p>
3	Mains switch (back of the control unit)	Switching on the line voltage including that for AMU computer and monitor.

4.2 Starting the AML/J system

Perform the following steps to start the AML/J system.

Step 1 Ensure that:

- the access doors are closed



ATTENTION!

The robot requires sufficient free space for the homing run.

All axes of the robot move during the homing run. Objects and system parts within the range of the robot can be damaged.



Warning!

The movements of the mechanical components in the AML/J system can cause severe injuries. Ensure before switching the main switch on (position 1) that there are no dangers for persons or equipment.

Step 2 Switch the mains switch on the AMU PC on
The AMU PC is located in the control cabinet, above the control unit (Figure 2-2: on page 2-3).
In systems with a Dual-AMU, take care that the change-over switch for the monitor, keyboard and mouse is switched to the computer which you just switch on.
Once the initialization of the first computer is ended, switch this switch over and switch the second computer on.

Step 3 Switch the main switch on (position 1)

The main switch lights up green.

Step 4 Press the *<System on>* button
(only in systems with HICAP)

The <Control on> button lights up green

The AML/J system is supplied with power. The software in the AMU and in the control units starts with the initialization. The status is indicated in the AMU log.

The robot and the storage towers perform a homing run, the gripper functions are tested in conclusion.

Step 5 Check in the **AMU Log** that the system has started correctly.

<0700> STATUS: robot ready.

4.3 Stopping the AML/J system

The AML/J system can be stopped normally or switched off in an emergency.

Information

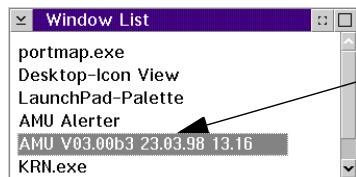


The method described under *Emergency shutdown* may be used only in emergencies.

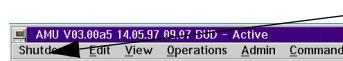
4.3.1 Normal stopping

Proceed as follows to stop the AML/J system normally:

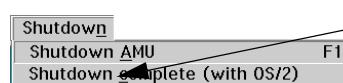
Step 1 Ensure in your application that your application is not endangered by the shutdown
(☞ Documentation of the host software).



Step 2 Find the "AMU V0..." window on the AMU PC
• Open the "Windows List" window with the <Esc> and <Ctrl> keys
• Mark the "AMU V0..." line with the arrow keys
• Press the <Enter> key

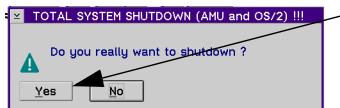


Step 3 Click in the "AMU V0..." window on the first cell (Shutdown) with the mouse.



Step 4 Click in the now open list on the **Shutdown complete (with OS/2)** line

Step 5 Click with the mouse on the "Yes" button in the now open "TOTAL SYSTEM SHUTDOWN (AMU and OS/2)!!!" window



The robot ends its current task and moves into the rest position.

Step 6 Wait until all windows are closed and the message "OS/2 System is now shutdown" is displayed. The process can last relatively long (5 minutes).

Step 7 Switch the mains switch on the AMU PC off (PC is located above in the control cabinet)



Step 8 Switch the main switch off

The power supply to the AML/J system is switched off.

4.3.2 Emergency shutdown

Apply the following procedure in an emergency situation.

Except for emergency situations, the AML/J system should be stopped normally before the main switch is switched off. ADIC/GRAU Storage Systems accepts no responsibility for damage because of use of the main switch not as intended. The user bears the entire risk.



WARNING!
Dangerous voltage!

The system is not deenergized completely with the main switch.

Step 1 Actuate the main switch

The power voltage of the AML/J is switched off. All movements of the robot are stopped.

4.4 Restarting the AML/J system

The AML/J system is restarted as follows after an emergency shutdown.

- Step 1** Rectify all problems which made stopping the AML/J system necessary (if required).
- Step 2** Start the AML/J system according to the procedure *Starting the AML/J system* on page 4-3.

4.5 Manual operating mode

This operating mode is intended if the AML/J should be operated without the robot because of a robot fault or maintenance. In this operating mode the requirements are displayed in the AMU but the user performs the actions instead of the robot.

Step 1 Shut the system down according to *Stopping the AML/J system* on page 4-4

Step 2 Open the access doors to the archive

Step 3 Switch the mains switch on the AMU PC on

Step 4 Select the manual operating mode of your host software (HACC/MVS or ROBAR) or on the AMU:

- Host command **MAN** with **MAN** option
- AMS the **Manual Operation** command in the **Operations** menu

The Manual Operation window is opened.



Figure 4-2: "Manual Operation" window

Step 5 Start your application or repeat still pending Mount- KEEP or Eject tasks.

The task is displayed in the Manual Operation window.

Step 6 In the case of MOUNT remove the cartridge from the rack and place it in the stated drive.
In the case of KEEP remove the cartridge from the drive and place it in the I/O unit.

Step 7 Click on **OK** button in the **Manual Operation** window.

Step 8 Repeat Step 6 and Step 7 until you start in normal mode again.

4.6 Switching over to Dual-AMU

On switching over the passive AMU becomes the active AMU and if possible, the active AMU becomes the passive AMU. The connections of the connection cables between AMU computer and control unit must be changed over for the change.

Prerequisites

- 2 AMU computers are installed and in operation
- Both AMU computers are configured identically

Procedure

Step 1 Stop the command stream to the system:

- with the “HOLD” command for HACC/MVS
- by “Setting offline” the drives in the system

Step 2 Switch the AML/J off (*Stopping the AML/J system* on page 4-4).

Step 3 Change over the connections of the following cables at the control rack:

- Scanner interface cable X17 (COM 2)
- Ribbon cables XJ11, XJ5 and XJ3

Step 4 Close the side door of the control cabinet

Step 5 Switch the AMU (B) computer on

Step 6 Open the AMU log in the **View** menu with the **Log** command

Step 7 Switch the main switch S3 on the control rack on

Step 8 Switch the host to the Dual-AMU with the corresponding host command

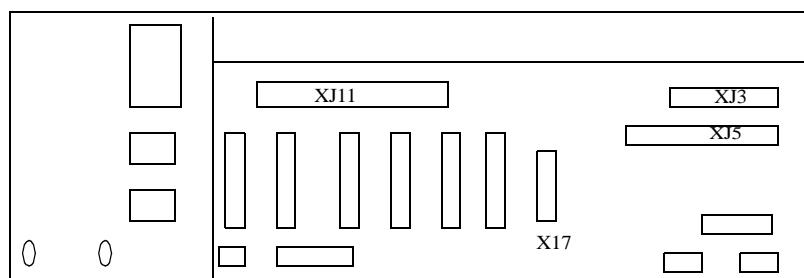


Figure 4-3: Plug board of the AML/J control rack

Step 9 Check that after switching over the components the system reports that it is ready. If the robots do not report that they are ready, there is another or a further error in the system.

Step 10 Determine which commands have not yet been acknowledged by the AMS software:

- HACC/MVS command "DRQ all"
- Search through the log file of the host software for commands to the AMU without acknowledgement

Step 11 Determine where the media belonging to the outstanding commands are located:

- by entering the archive and inspecting the drives and home positions in the archive
- by the "Stocktaking" command on the home compartments of the media concerned (refer to the description of your host software for the syntax of this command)

Step 12 Compare these positions with the data in the database of the AMU

Step 13 In the case of discrepancies change the AMU database and in HACC/MVS systems in addition the HACC/MVS database

Step 14 Start the communication to the system

- by the HACC/MVS Release command
- by "Setting online" the drives

Step 15 Repeat the commands which are still outstanding and still required. Delete the commands which are no longer required from the command queue.

5 Menus and commands

The entries on the workspace of the AMS are equivalent to host commands for the system.



ATTENTION!

Take special care in the case of the Put, Get, Look and Teach commands that conflicts with the host commands do not arise.

In the case of doubt restart the AMU after working with these commands.

An AMU restart (AMS and DAS) is essential after a change in the configuration.

Make entries on the AMU only in the following case:

- In the case of a host communication fault
- In the case of a fault of the robot (manual updating of the archive catalogue after manual processing  Operator Guide)
- During the installation
- During maintenance



Information

All commands or options which cannot be executed are shown shaded.

5.1 Application

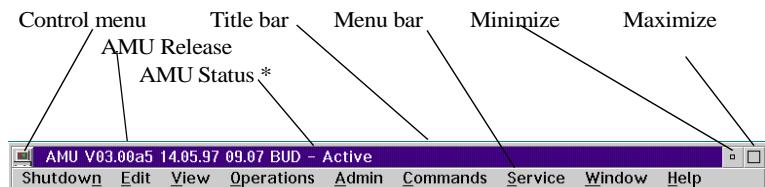
The layout as well as the application correspond to the SAA standard.

Working with the

- Keyboard
- Mouse

You will find further information in the OS/2 Guides.

5.1.1 Layout of the menu bar



* **BUD - Active** - AMU which currently controls the AML

BUD - Passive - AMU inactive, router sends to active AMU

BUD - Active: Partner lost - no connection to the Dual-AMU

Shutdown in Progress - Shutdown command has been executed

Figure 5-1: Layout of the AMS menu bar



Information

In the active window the title bar is dark; in the inactive window the title bar is light.

The following functions are the same in all windows:

Button	Function
	Cancels the current function and closes the window
	Opens the online help.

Control menu

Restore	Alt+F5
Move	Alt+F7
Size	Alt+F8
Minimize	Alt+F9
Maximize	Alt+F10
Hide	Alt+F11
Shutdown ABBA System	
Window list	Ctrl+Esc

Figure 5-2: AMU control menu

5.1.2 Selecting a command

With the mouse

Step 1 Move the mouse pointer to the required menu in the menu bar

Step 2 Click on the menu

The menu opens

Step 3 Click on the command in the menu

The command window opens

With the keyboard

Step 1 Press <ALT> and the letter underlined in the menu bar

The menu opens

Step 2 Now press the letter underlined in the menu to select the command

By shortcuts

If a key or a key combination is stated next to the command, you can select this command directly with it.

5.1.3 Change size of the windows

Changeable windows have a surrounding frame (e. g. Trace window).

Step 1 Move the mouse to any corner of the active window

The mouse pointer changes its form to a double arrow

Step 2 Press the mouse button and draw out the window to the required size with the mouse button pressed

5.1.4 Move windows

Step 1 Move the mouse pointer into the title bar

Step 2 Move the window with the mouse button pressed

5.1.5 Close window

Step 1 You close the window by double-clicking on the control menu

5.2 Menu overview

All commands of the AMS workspace are explained here:

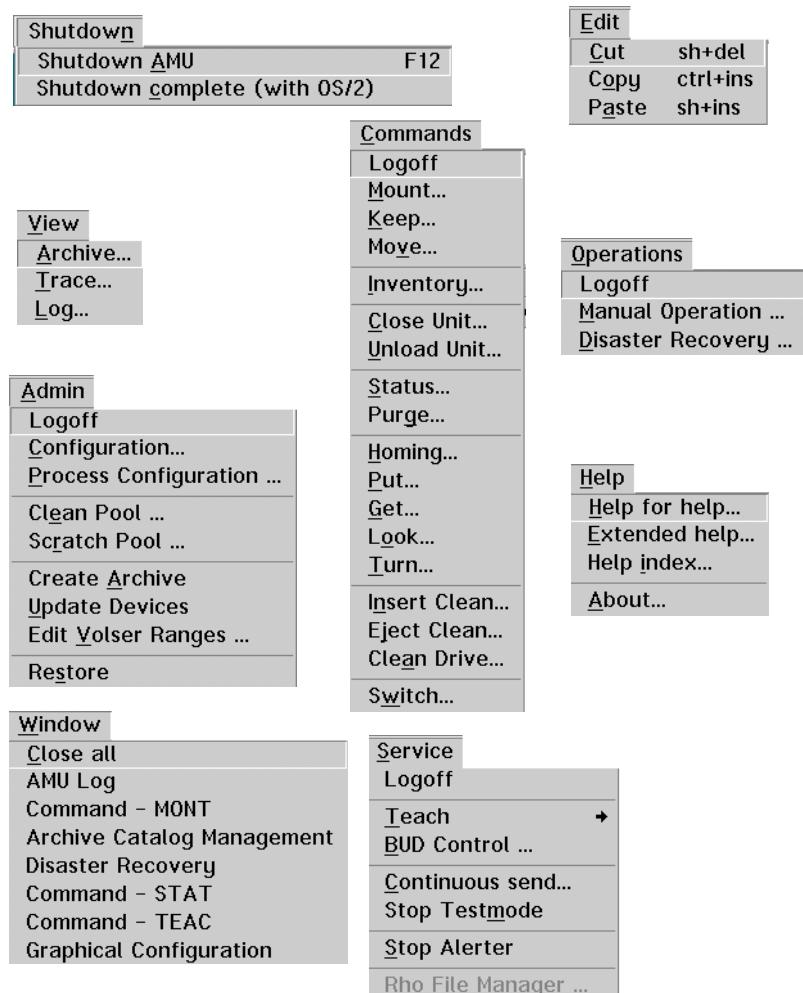


Figure 5-3: AMS menu overview



Information

When the Dual-AMU is used, only the Switch command can be executed on the passive AMU (also the View Archive Catalog Management command is not allowed on the passive AMU). Enter all commands on the active AMU.

5.3 Shutdown menu



Figure 5-4: "Shutdown" menu

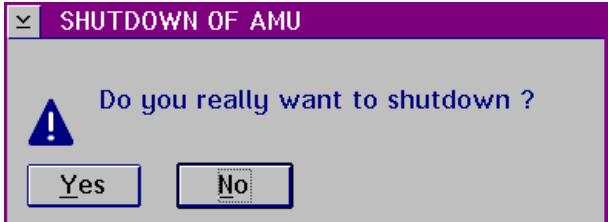
Command	Field	Explanation
Shutdown AMU	Prepare shutdown of the AMU system.	

Figure 5-5: "SHUTDOWN OF AMU" window



ATTENTION!

Before shutting down stop the communication with the host computer (e. g. with HOLD 1,1).

Shortcut: Function key F12

Yes	The current command is still processed. All modules of the AMU are then ended and the database is closed.
No	Return to the program, no shutdown.

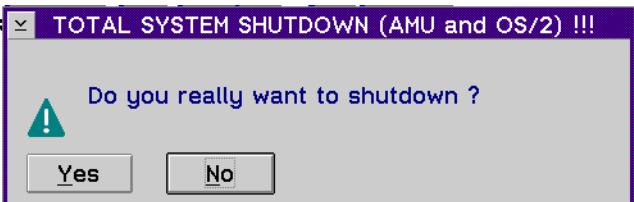
Command	Field	Explanation
Shutdown complete (with OS/2)	Prepare shutdown of the AML system (as in Shutdown only AML-System) and then break off all processes under OS/2 and perform OS/2 system shutdown.	 <p>The image shows a window titled "TOTAL SYSTEM SHUTDOWN (AMU and OS/2) !!!". Inside the window, there is a warning icon (an exclamation mark inside a triangle) and the text "Do you really want to shutdown ?". Below the text are two buttons: "Yes" and "No".</p>

Fig. 5-6: "TOTAL SYSTEM SHUTDOWN" window



ATTENTION!

Before shutting down stop the communication with the host computer (e. g. with HOLD 1,1).

5.4 Edit menu

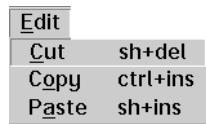


Figure 5-7: "Edit" menu

Command	Explanation
Cut	Cutting out the marked object and saving it in the clipboard (memory of the computer). Shortcut: Key combination <Shift>+<Delete>
Copy	Copying the marked object into the clipboard. Shortcut: Key combination <Control>+<Insert>
Paste	Inserting the object from the clipboard at the current cursor position. Shortcut: Key combination <Shift>+<Insert>

5.5 View menu



Figure 5-8: "View" menu

Selecting information in different display windows.

5.5.1 Archive

Possibility of controlling and changing archive catalogue entries for the compartments.

After entry either of the Volser or selection of a coordinate all associated information from the database is displayed. If a Volser is present several times, only the first entry in the database is displayed.

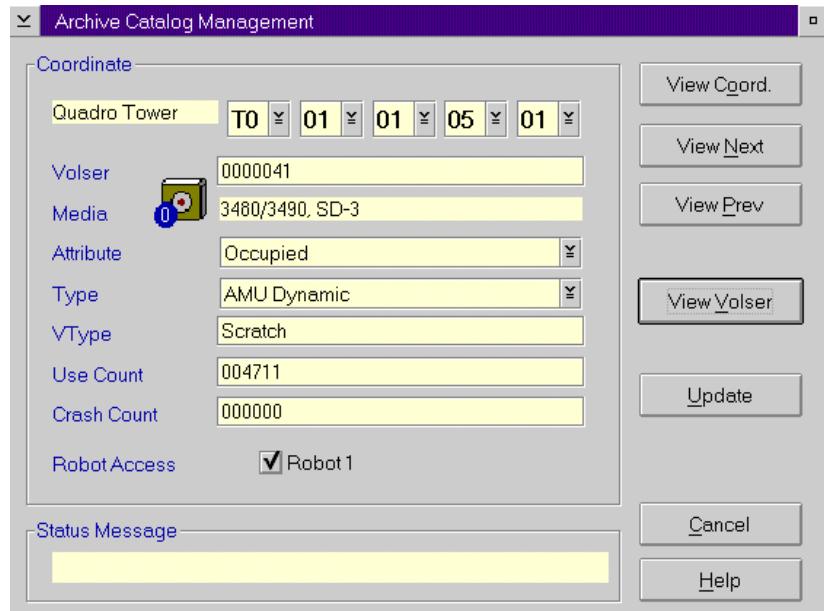
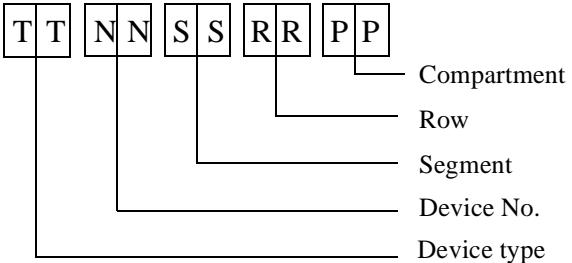


Figure 5-9: "Archive Catalog Management" window

Field	Explanation
Coordinate	Logical coordinates of the medium in the archive.
	<p style="text-align: center;">Information</p>  <p>An optical disk occupies 2 logical coordinates, one each for the front and reverse side.</p> <p>The individual places of the coordinates have the following contents:</p> 
Volser	<p>List of all device types (☞ AMU Reference Guide)</p> <p>Select with the aid of the 4 selection fields the required coordinate for the display of the data block of a coordinate</p> <p>Serial number of the medium, represented by a barcode, also called VSN.</p> <p>The Volser is alphanumeric and 1 to max. 16 characters in length.</p> <p>Inadmissible Volsers are:</p> <ul style="list-style-type: none"> • 0000000000000000 • CLEAN <p>Enter the Volser in the field to find the medium in the database.</p>
Medium	<p>Type of the medium for monitoring the archive - drive assignment</p> <p>Medium cannot be changed in the Archive Catalog Management.</p> <p style="text-align: center;">Information</p>  <p>A distinction is not made basically between all different types of media with the same media housing.</p>

List of all media types (☞ AMU Reference Guide)

Field	Explanation	
Attribute	Status of the medium (the characters in brackets are the variables for the database)	
Occupied (O)	Medium occupies compartment	
Ejected (E)	Compartment empty, medium ejected	
Mounted (M)	Compartment empty, medium in the drive	
Initial (I)	Not used attribute	
In Jukebox (J)	Compartment empty, optical disk in the jukebox	
Reverse Side Mounted (R)	Compartment empty, optical disk in the drive (reverse side)	
Empty (Y)	Compartment empty	
Undefined (U)	Not defined (special attribute for HACC/MVS)	
Temp Away (T)	In AML/2 twin robot system the compartment in the storage tower is occupied temporarily for passing through to the other robot	
Temp Here (A)	Occupied compartment in the problem box	
Type	Type of the compartment in the archive	
Storage (S)	<ul style="list-style-type: none"> Archive compartment for <ul style="list-style-type: none"> hierarchically defined Volser ranges dynamically defined Volser ranges only in HACC/MVS no Clean 	
Clean (N)	Cleaning media compartment	
AMU-Dynamic (A)	(not in HACC/MVS): Archive compartment for dynamic insertion and passing through	
	Type of the compartment in the I/O unit	
Foreign (F)	Foreign media compartment	
Problem (P)	Compartment in the problem box (I/O unit)	

Field	Explanation
HACC-Dynamic (D)	Archive compartment for dynamic use of the I/O unit under HACC/MVS
AMU-Dynamic (A)	Archive compartment for dynamic use of the I/O unit (in HACC/MVS only for optical disk)
VType	<p>Volser type for storage media</p> <ul style="list-style-type: none"> Undefined (U): Undefined (no scratch medium or scratch media management not on the AMU) scratch (S): Scratch medium <p>VType cannot be changed in the Archive Catalog Management.</p>
	<p>Information</p>  <p>The value of this field can be changed only with a host command.</p>
Use Count	<p>Number of accesses to the compartment.</p> <p>Use Count cannot be changed in the Archive Catalog Management.</p>
Crash Count	not used
Robot Access	Access right of the robot to the compartment
Status Message	<p>Answer of AMS with message number (☞ AMU Reference Guide)</p> <p>after an unsuccessful command (e. g. Not found: RC = 1032)</p>

Commands

Command	Explanation
View Coordinate	Display of the archive catalogue entry for the entered logical archive coordinate.
View Next	Display of the archive catalogue entry of the next coordinate of the component. If the last coordinate is reached, there is no further paging.
View Prev	Display of the archive catalogue entry of the previous coordinate of the component. If the first coordinate is reached, there is no further paging.
View Volser	Display of the archive catalogue entry for the entered Volser.
Update	<p>Information</p>  <p>This command can be executed only after logging in as administrator or supervisor.</p>
	Changing the AMU archive catalogue for the archive coordinate.
	<p>ATTENTION!</p>  <p>The existing entry is only overwritten in the AMU archive catalogue. If there are incorrect entries, discrepancies in the archive and to the HACC/MVS archive catalogue can arise.</p>

5.5.2 Trace

Online or offline trace of the internal processes of the AMU software (AMS and DAS). You can select the traced processes according to areas (processes of the AMU).



Information

Processing can be slowed down by selecting Trace!

Change the selection only after consultation with ADIC/GRAU Storage Systems (Support) or ADIC.

Standard selection: no traces



ATTENTION!

The concurrent trace has only a limited memory. Save the trace as quickly as possible in the case of error.

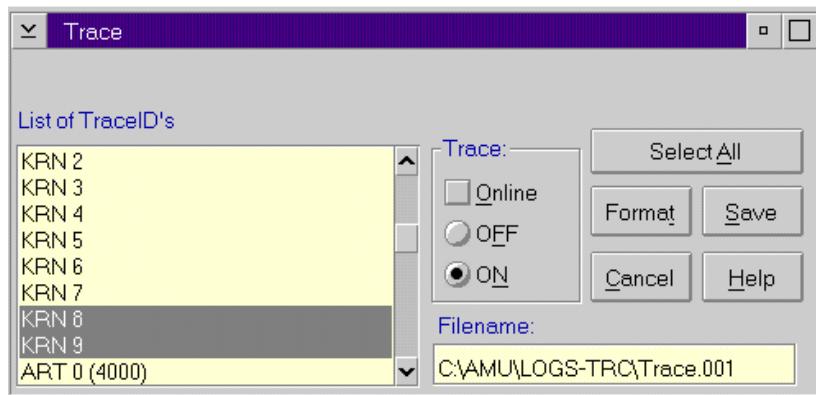


Figure 5-10: "Trace" window

Field/command	Explanation
List of TraceID's	Select the trace levels with <Space bar> or the mouse. List of all Trace ID's (☞ AMU Reference Guide)
Trace: ✓ Online	The current trace is displayed additionally on the screen with <ul style="list-style-type: none">• Time of day• Trace-ID (e.g. 03100 means Trace KRN 1)• Trace entry (depending on trace type)

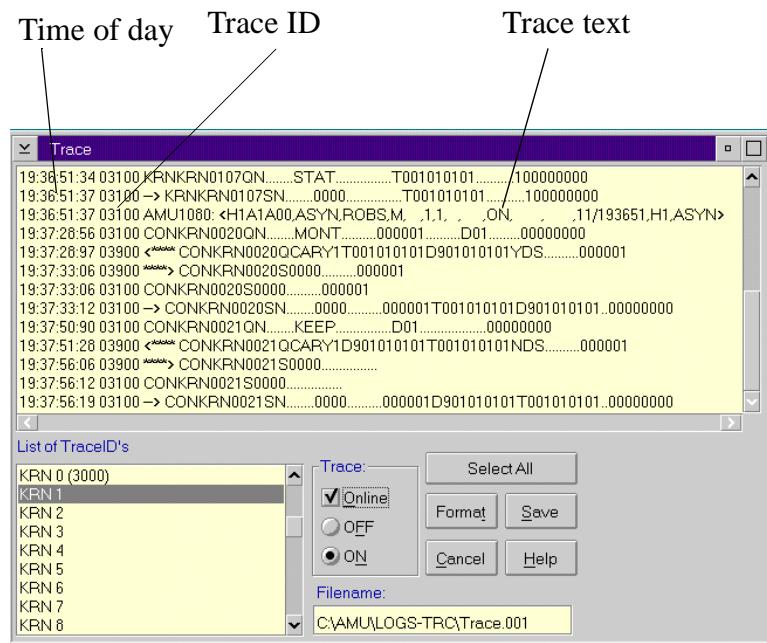


Figure 5-11: "Trace" window (Online)

OFF The trace is switched off.

ON Writes the current traces in the main memory (1 MB reserved). If the memory is exhausted, the oldest entry is written over.

Select All / Unselect All All entries in the online trace window are marked or the marking is removed

Filename Path and file name of the trace in binary format, after execution of the **Save** command

Save Saving the traces in a file with the name preset in the Filename field in binary format
Select this command immediately after occurrence of the problem so that the trace information is not lost. You can print this file with the OS/2 Print command only after formatting (**Format**).

Format Brings a trace file saved with the **Save** command into a printable form (ASCII).

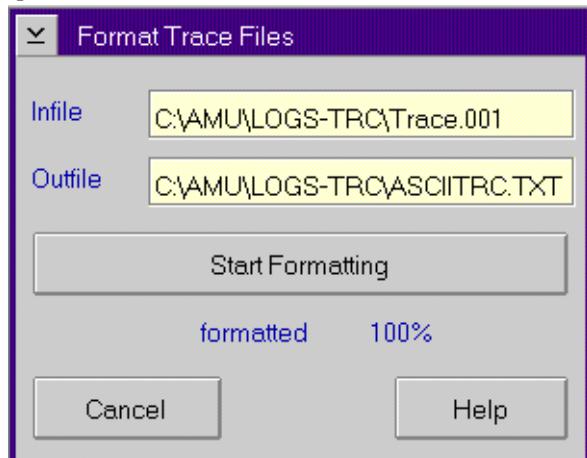


Figure 5-12: "Format Trace Files" window
: Target file name with path
(e. g. **a:\name** or
c:\amu\logs-trc\name).
starts the formatting.
Execution is confirmed by outputting the "**formatted 100%**" text.

Infile Path and name of the binary trace file for conversion into ASCII format (default: C:\AMU\LOGS-TRC)

Outfile Path and name of the ASCII trace file after conversion into ASCII format

Start Formatting Execution of formatting
Select this command after you have entered the file names in the **Infile** and **Outfile** field.

formatted Status display of formatting, formatting is completed at **100%**.

5.5.3 Log

The Alerter logs all messages (even if the AMU-Log Control Center window is not opened).

Examples:

- Commands of the host computer
- Execution of the commands
- Messages to the host computer
- User interventions
- Error messages

Log files start daily at 0.00 hours. If the available memory on the hard disk drops below a value defined in the ARTCFG.DAT configuration file (default 40 MB), the oldest log files are deleted.



Information

Log files cannot extend over several days!
There is only one log file for each day.

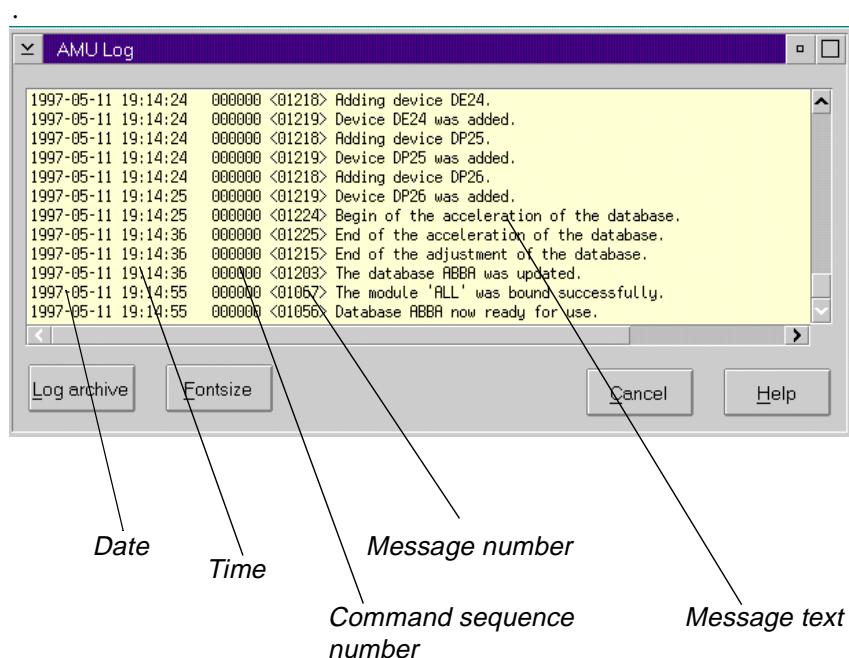


Figure 5-13: "AMU Log" window

Field/command	Explanation
Log archive	Opens a window for selecting the saved log files with automatic display in the OS/2 editor EPM The log file name is composed of lo <YY><MM><DD>.001 <YY>: Year <MM>: Month <DD>: Day

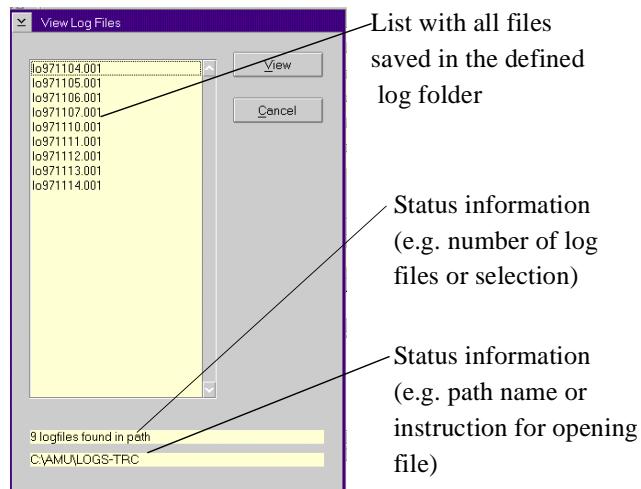


Figure 5-14: "View Log Files" window

View	Copies the selected file into a temporary file (logview.txt). This file is displayed in the OS/2 editor EPM and can be edited further as desired.
-------------	---

Fontsize

Selection of font, size and style for the contents in the **AMU Log** window

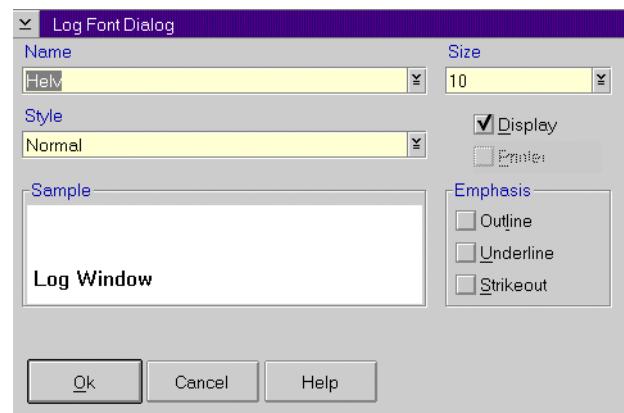


Figure 5-15: "Log Font Dialog" window

Name Drop-down list box for all installed fonts

Size Drop-down list box of the size for the selected font in pt

Style Drop-down list box of the style of the selected font (available only for certain fonts)

Display Selection of the screen fonts, do not change the setting

Printer not used

Outline Outlined type

Underline Underlined type

Strikeout Struck through type

Sample Display of an example of the selected font

Ok Activates the selection for the current AMU log. On renewed opening of the AMU Log window, the default font (system VIO) is used again.

5.6 Operations menu

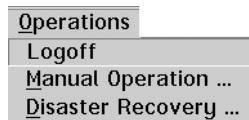


Figure 5-16: "Operations" menu

5.6.1 Operator login

Command	Field	Explanation
Login (Operator) / Logoff	To use the disabled functions in the Operator menu, you must log in as operator, administrator or supervisor For protection against unauthorized use, you should log off after the application	

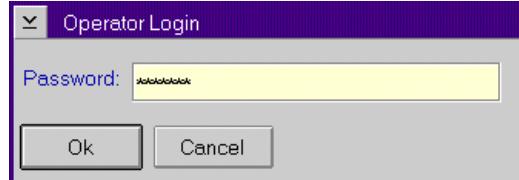
A screenshot of a Windows-style dialog box titled 'Operator Login'. It contains a label 'Password:' followed by a text input field containing '*****'. At the bottom are two buttons: 'Ok' and 'Cancel'.

Figure 5-17: "Operator Login" window

Password Field for entering the operator password. You receive this password from your system administrator

Ok Execution of the login process

5.6.2 Manual Operation

Prerequisite: "MANUAL" operating mode

Manual execution of the host commands of **Mount** and **Eject** by the operator.

Step 1 Switch the main switch off

Step 2 In the case of **Mount** commands, mount the cartridge in the stated drive

Step 3 Confirm the execution of the displayed command with **OK**

The executed task is acknowledged to the host computer and this shows the next command

Step 4 On resumption of the automatic mode, perform an insertion operation for all cartridges used in the manual mode

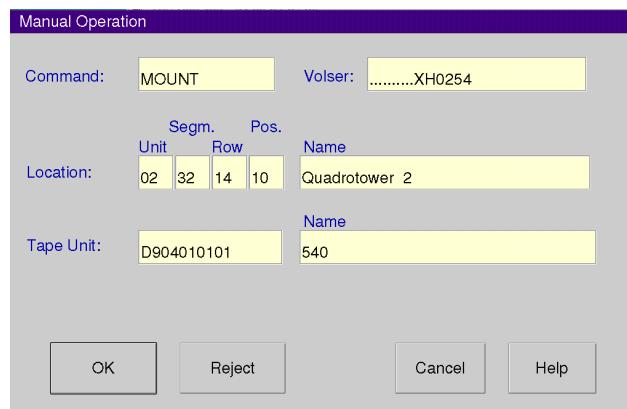


Figure 5-18: "Manual Operation" window

Command/ field	Explanation
Command	Command of the host which should be performed by the operator
Volser	Search in Location for the Volser or VSN to execute the command

Command/ field	Explanation
Location	Statement of the coordinates in the archive where the Volser for the command is currently located
Unit	Number of the storage tower or rack
Segm.	Number of the segments for the storage towers
Row	Row in the segment (counting from below to above)
Pos.	Compartment (counting from left to right)
Name	Designation (comment) which is allocated to the component in the configuration
Drive	Place the medium with the Volser in the drive designated in this field With an EJECT command (ejection) the field remains free
	Name Designation (comment) which is allocated to the drive in the configuration
OK	Actuate after the command has been executed by the operator. Database update is performed, host receives positive response
Reject	Actuate if the command has not been executed by the operator. Database update is not performed, host receives negative response

5.6.3 Disaster Recovery

Dialog box for starting the ejection of preselected media in an emergency (Disaster Recovery). The window is divided into two sections for independent rejection of the media in AML/2 twin robot systems.

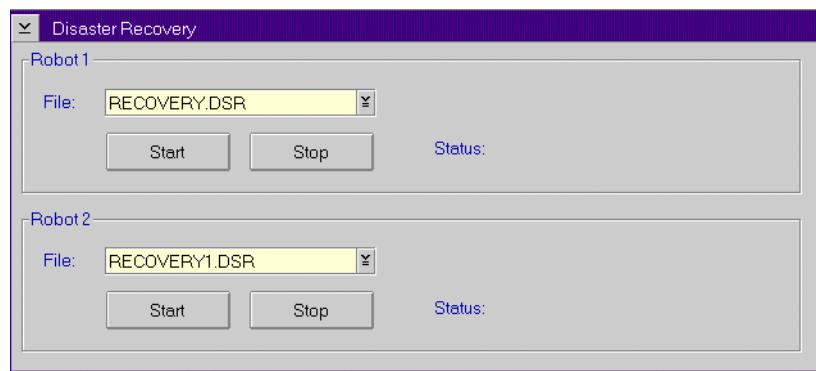


Figure 5-19: "Disaster Recovery" window

Command/ field	Explanation
File	Drop-down list box for selecting the prepared files with Volsers for ejection. Display of all files in the C:\AMU\RECOVERY\ folder with file name * .DSR (☞ AMU Reference Guide)
Start	Starting the ejection of the media from the selected file
Stop	Interruption of ejection
Status	Display of the current situation on ejection

5.7 Admin menu

The functions of the Admin menu item are described in the AMU Reference Guide.

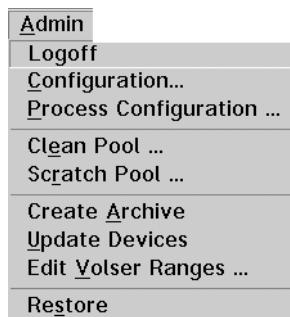


Figure 5-20: "Admin" menu

5.7.1 Administrator Login

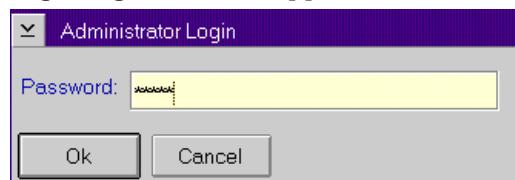
Command	Field	Explanation
Login (Administrator) Log-off		To use the disabled functions in the Admin menu you must log in as administrator or supervisor For protection against unauthorized use you should log off again after the application
		

Figure 5-21: "Administrator Login" window

Password Field for entering the administrator password. You receive this password from your service partner, ADIC/GRAU Storage Systems or ADIC

Ok Execution of the login process.

5.8 Window menu

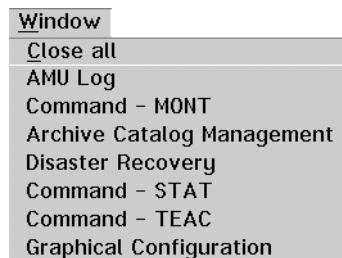


Figure 5-22: "Window" menu

Command	Explanation
Close all	Closing all opened windows
Window (list of all opened windows)	Selection of the corresponding window

5.9 Help menu

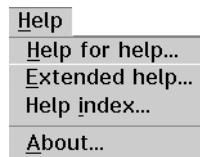


Figure 5-23: "Help" menu

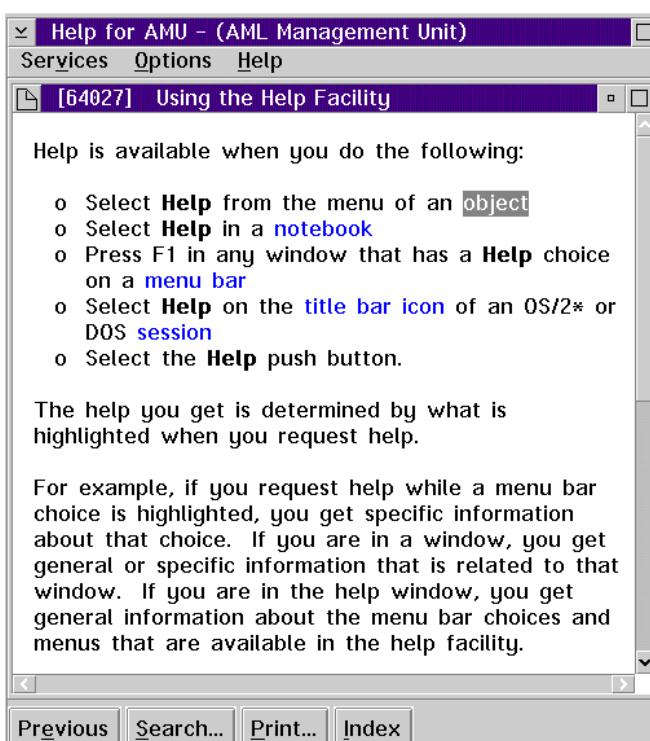
Command	Explanation
Help for help...	<p>Information of the use of the start page of the help functions.</p>  A screenshot of a help window titled 'Using the Help Facility'. The window contains a list of instructions on how to request help, including selecting 'Help' from a menu, pressing F1, or using a help push button. It also explains that the help requested is determined by the highlighted choice. The window has standard window controls and buttons for 'Previous', 'Search...', 'Print...', and 'Index' at the bottom.

Figure 5-24: "Using the Help Facility" window

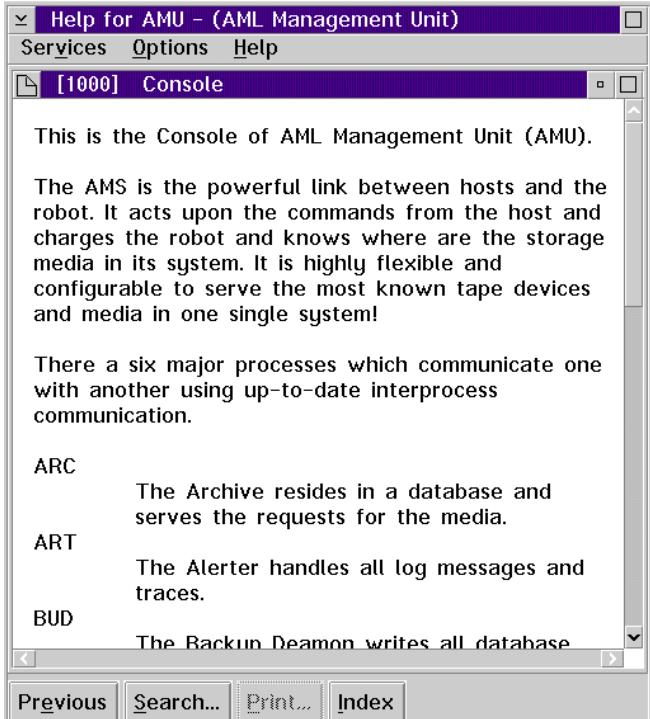
Command	Explanation
Extended help...	Start page for the AMU online help.
	 <p>This is the Console of AML Management Unit (AMU).</p> <p>The AMS is the powerful link between hosts and the robot. It acts upon the commands from the host and charges the robot and knows where are the storage media in its system. It is highly flexible and configurable to serve the most known tape devices and media in one single system!</p> <p>There are six major processes which communicate one with another using up-to-date interprocess communication.</p> <p>ARC</p> <p>The Archive resides in a database and serves the requests for the media.</p> <p>ART</p> <p>The Alerter handles all log messages and traces.</p> <p>BUD</p> <p>The Backup Daemon writes all database</p>

Figure 5-25: "Help for AMU - (AML Management Unit)" window

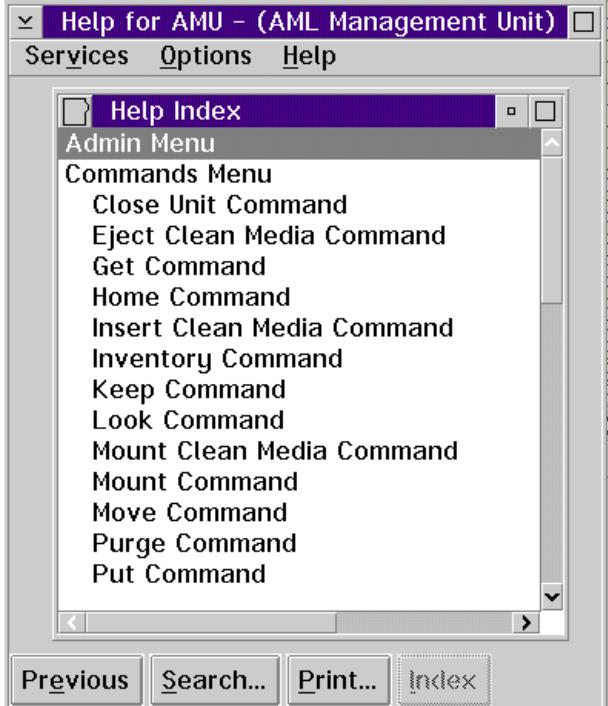
Command	Explanation
Help index...	Help index 

Figure 5-26: "Help Index" window

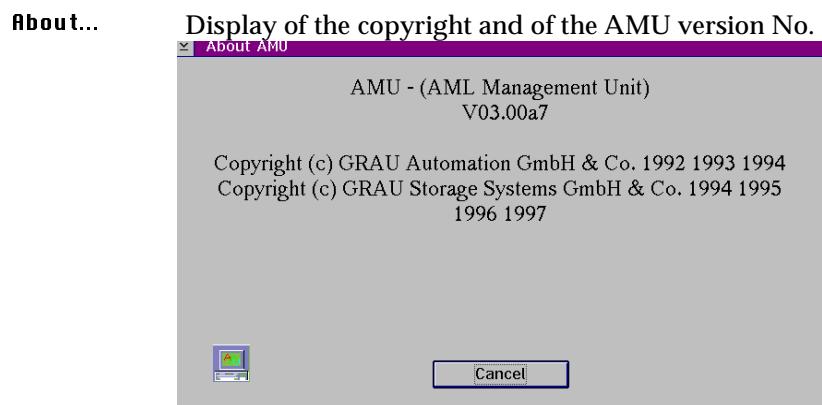


Figure 5-27: "About AMU" window

6 Processing media

6.1 Overview

In the normal operating procedure cartridges must be added to the AML/J or removed from it. Three types of I/O units are available for inserting or ejecting cartridges.

- I/O unit/C
- I/O unit/D (HICAP)
- I/O unit/E

There are different functional ranges in the I/O unit for the different applications:

- "Problem" range
- "Foreign" range
- "HACC Dynamic" range
- "AMU Dynamic" range

The "Foreign", "HACC Dynamic" and "AMU Dynamic" ranges are defined in the Logical Ranges function in the AMS.

Table 6-1: Ranges in the I/O unit

	Problem	Foreign	HACC Dynamic	AMU Dynamic
Position	Fixed range with extra large compartments	Configurable range in the magazines		
Use	Cartridges which are mechanically damaged or cannot be identified by the system, partially also storage of used cleaning media	Cartridges with labels foreign to the system (no or not readable barcode)	Cartridges which should be inserted or ejected with HACC/MVS	Cartridges which should be inserted or ejected with all applications except for HACC/MVS
Identification	Not possible	Not possible	With commands of the HACC/MVS host software	Automatically after changes (removal of the magazine)
Robot access	Only storage	Transport from and to the drive, in the case of problems to the problem box	Transport from and to the archive	Transport from and to the archive or to the drive
Volser		Symbolic Volser commencing with the symbol "*" e.g. "*FR001"	6-digit alphanumeric Volser	Alphanumeric Volser with one to 16 characters

Before using the I/O unit obtain information about the configuration of the ranges in your system:

- AMS Graphical Configuration
- HACPARM in HACC/MVS

6.2 I/O unit/C

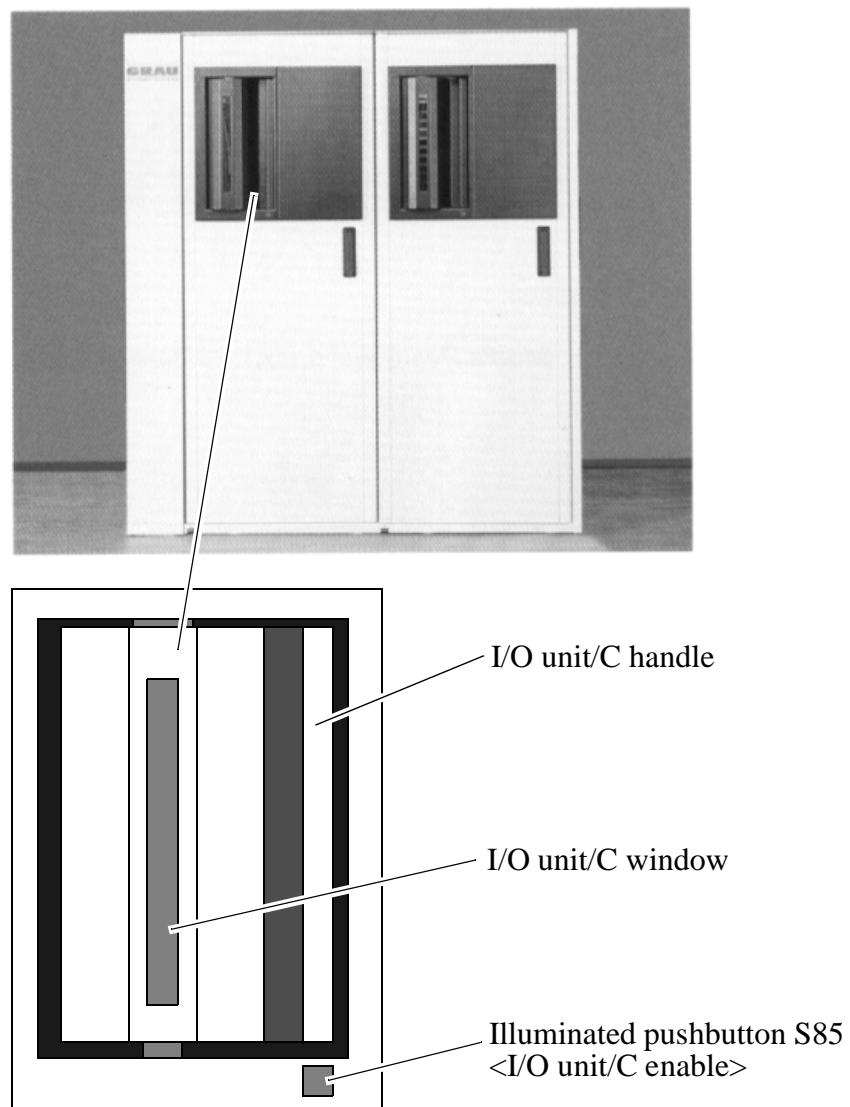


Figure 6-1: I/O unit/C

Production is not interrupted when inserting cartridges through the I/O unit. Insert the cartridges in the I/O unit as follows:

6.2.1 Inserting cartridges

New cartridges are inserted in the AML/J through the I/O unit.

Step 1 Press the button on the I/O unit

The button on the I/O unit lights up green and the I/O unit is unlocked

Step 2 Open the door of the I/O unit

Step 3 Empty the problem box places if cartridges are there

Step 4 Insert the cartridges in the I/O unit. Pay attention to the correct position.

- Tape head down
- Label to the front

Step 5 Close the door of the I/O unit

The AML/J locks the I/O unit .

According to configuration, the robot checks the magazine (barcode or empty place) on the cartridges.

Step 6 Move the cartridge with the aid of the host software into the archive
(exception: foreign mount cartridges)

The cartridges are brought into the archive.

6.2.2 Ejecting cartridges

Cartridges are ejected from the AML/J through the I/O unit.

Production is not interrupted when ejecting cartridges with the I/O unit.
Eject the cartridges as follows with the I/O unit:

Step 1 Perform the ejection command from your application or HOST software.

The cartridges are brought into the I/O unit

Step 2 Press the button on the I/O unit

The button on the I/O unit lights up green and the I/O unit is unlocked

Step 3 Open the door of the I/O unit

Step 4 Empty the problem box places if cartridges are there

Step 5 Remove the cartridges from the I/O unit

Step 6 Close the door of the I/O unit

The AML/J locks the I/O unit .

According to configuration the robot checks the magazine (barcode or empty place) on the cartridges.

6.3 I/O unit/D (HICAP)

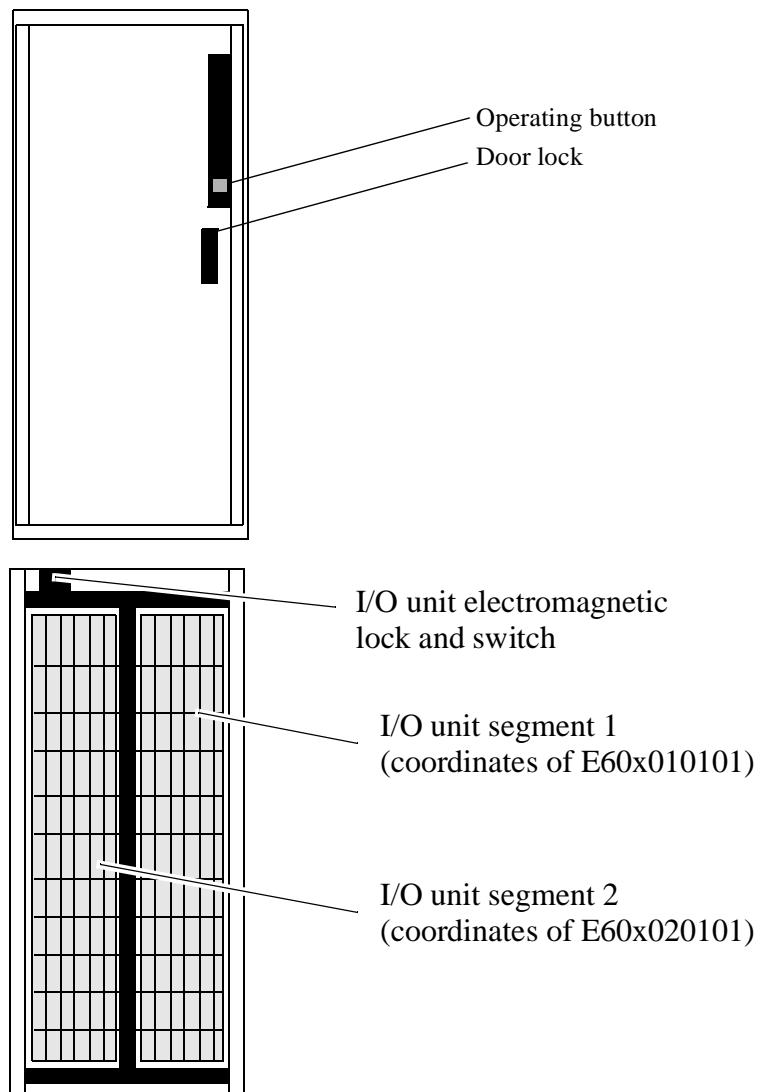


Figure 6-2: I/O unit/D

Production is interrupted when inserting cartridges through the I/O unit/D. Insert the cartridges in the I/O unit as follows:

6.3.1 Inserting cartridges

New cartridges are inserted in the AML/J through the I/O unit.

Step 1 Press the button on the I/O unit

The robot moves into the rest position. The power voltage of the robot control is switched off. The button on the I/O unit lights up green and the I/O unit is unlocked.

Step 2 Open the door of the I/O unit

Step 3 Insert the cartridges in the I/O unit. Pay attention to the correct position.

- Tape head to the right
- Label to the front

Step 4 Close the door of the I/O unit

Step 5 Press the <Control on> button

The power voltage is switched back on. The AML/J locks the I/O unit. The robot performs a homing run.

According to configuration the robot checks the magazine (barcode or empty place) on the cartridges.

Step 6 Move the cartridge with the aid of the host software into the archive
(exception: foreign mount cartridges)

The cartridges are brought into the archive.

6.3.2 Ejecting cartridges

Cartridges are ejected from the AML/J through the I/O unit.

Production is not interrupted when ejecting cartridges with the I/O unit. Eject the cartridges as follows with the I/O unit:

Step 1 Perform the ejection command by your application or HOST software.

The cartridges are brought into the I/O unit

Step 2 Press the button on the I/O unit

The robot moves into the rest position. The power voltage of the robot control is switched off. The button on the I/O unit lights up green and the I/O unit is unlocked.

Step 3 Open the door of the I/O unit

Step 4 Remove the cartridges from the I/O unit

Step 5 Close the door of the I/O unit

Step 6 Press the <Control on> button

The power voltage is switched back on. The AML/J locks the I/O unit. The robot performs a homing run.

According to configuration the robot checks the magazine (barcode or empty place) on the cartridges.

6.4 I/O unit/E

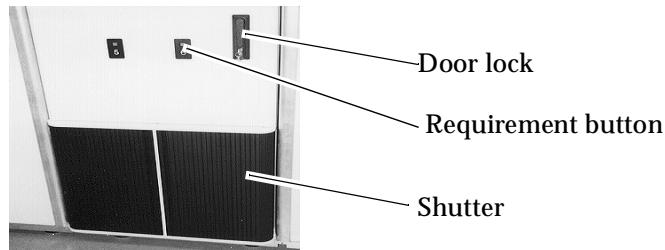


Figure 6-3: Two I/O units/E

6.4.1 Inserting cartridges

New cartridges are inserted in the AML/J through the I/O unit.

Step 1 Press the button on the I/O unit

The button lights up green. On release by the robot control the shutter is unlocked.

Step 2 Open the shutter of the I/O unit

Step 3 Pull out the slide of the I/O unit

Step 4 Remove the magazine

Step 5 Insert the cartridges in the magazine. Pay attention to the correct position.

- Tape head to the right
- Label to the front

Step 6 Put the magazine back in the I/O unit

Step 7 Push the slide back in

Step 8 Close the shutter of the I/O unit

*The AML/J locks the shutter of the I/O unit .
According to configuration the robot checks the magazine (barcode or empty place) on the cartridges.*

Step 9 Move the cartridge with the aid of the host software into the archive
(exception: foreign mount cartridges)

The cartridges are brought into the archive.

6.4.2 Ejecting cartridges

Cartridges are ejected from the AML/J through the I/O unit.

Production is not interrupted when ejecting cartridges with the I/O unit.
Eject the cartridges as follows with the I/O unit:

Step 1 Perform the ejection command by your application or HOST software

The cartridges are brought into the I/O unit

Step 2 Press the button on the I/O unit.

The button lights up green. On release by the robot control the shutter is unlocked.

Step 3 Open the shutter of the I/O unit

Step 4 Pull out the slide of the I/O unit

Step 5 Remove the magazine

Step 6 Remove the cartridges from the magazine

Step 7 Put the magazine back in the I/O unit

Step 8 Push the slide back in

Step 9 Close the shutter of the I/O unit

The AML/J locks the shutter of the I/O unit .

According to configuration the robot checks the magazine (barcode or empty place) on the cartridges.

6.5 Disaster Recovery

The Disaster Recovery function enables cartridges to be ejected, corresponding to a previously defined list (file) without host connection. The function is used after a failure of the host system for preparing the move into an alternate computer center.

Step 1 Unload all drives

Step 2 Bring these media back into the home position with the **KEEP** command

Step 3 Perform a login in the operator menu.

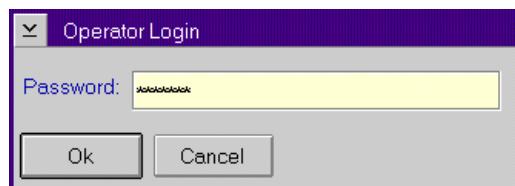


Figure 6-4: "Operator Login" window

Step 4 Select the **Disaster Recovery** command in the **Operator** menu

Step 5 Enter the password (defined in **Process Configuration**)

The Disaster Recovery window is opened.



Figure 6-5: "Disaster Recovery" window

Step 6 Select the file for ejection



Information

**The entire I/O unit is used for disaster recovery
(incl. foreign mount compartments)**

Step 7 Start the ejection with **Start**

Step 8 Empty all media from all I/O units as requested

Step 9 Confirm ejection with **OK**

The media are ejected in the order specified in the selected file

Step 10 Empty the I/O unit if the request appears on the workspace

Step 11 Continue ejection with **OK**

The command is acknowledged positively after ejection of the last medium.

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